

Abstract

The present invention discloses an optical switching element that uses reversible electroplating mirrors includes a trench with transparent sidewalls located at the intersection of two waveguides A and B. The trench has two electrodes; one, which is transparent, is placed on the trench sidewall and the other is placed on the trench floor. The trench is filled with an index-matching electrolytic solution containing ions of a metal that can electro-deposit on these two electrodes. To actuate the switching element, a negative electrical potential is applied to the sidewall electrode. Actuation causes metal deposits to form on the sidewall electrode, creating a mirror that reflects light from waveguide A to waveguide B. To deactivate the switching element, a positive electrical potential is applied to the sidewall electrode. Deactivation causes metal deposits move off the sidewall and form on the trench floor. The lack of metal deposits on the sidewall allows light to pass through the switching element and continue along the original waveguide A